

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) An apparatus for delivering a pharmaceutical product comprising:

a first driver element to generate acoustic energy, the first driver element generating acoustic energy in pulses that are of a short duration and low frequency such that a droplet of pharmaceutical product is output from a capillary wave;

a first acoustic lens positioned between the first driver element and the capillary wave to focus the acoustic energy generated by the first driver element; and

a delivery system to maintain the pharmaceutical product in a position to receive the acoustic energy from the first acoustic lens and cause ejection of the droplet of pharmaceutical product;

a portable energy source to provide energy to the first driver element; and

a second driver element coupled to the portable energy source to provide drive signal to
ejectors that eject droplets of the pharmaceutical product, wherein the second driver element
includes a multiplexing circuit that directs RF energy from the portable energy source to
alternately switch groups of the ejectors on and off.

2. (canceled)

3. (previously presented) The apparatus of claim 1 wherein the first acoustic lens is a fresnel lens.

4. (previously presented) The apparatus of claim 1 wherein the first acoustic lens is a plastic lens.

5. (previously presented) The apparatus of claim 1 further comprising:

a second acoustic lens to focus the energy generated by the first driver element and cause ejection of a second droplet of pharmaceutical product.

6. (canceled)

7. (canceled)

8. (canceled)

9. (currently amended) An apparatus for delivering a pharmaceutical product comprising:

a first driver element to generate acoustic energy, the first driver element designed to generate acoustic energy in pulses that are of a short duration and low frequency such that a plurality of droplets of pharmaceutical product is output from a capillary wave wherein the first driver element is programmed to output acoustic energy at a frequency below 15 MHz;

an acoustic lens positioned between the first driver element and the capillary wave to focus the acoustic energy generated by the first driver element; and

a delivery system to maintain the pharmaceutical product in a position to receive the acoustic energy from the acoustic lens and cause ejection of the droplets of pharmaceutical product;

an energy source to provide energy to the first driver element; and

a second driver element coupled to the energy source to provide drive signal to ejectors that eject the plurality of droplets of the pharmaceutical product, wherein the second driver element includes a multiplexing circuit that directs RF energy from the energy source to switch one or more groups of the ejectors on and off.

10. (original) The apparatus of claim 9 wherein the droplets of pharmaceutical product output due to capillary action are less than 10 micrometers in diameter.

11. (currently amended) An apparatus for delivering a pharmaceutical product comprising:

a first driver element to generate acoustic energy below 15Mhz directed to a capillary wave;

an acoustic lens positioned between the first driver element and the capillary wave to focus the acoustic energy generated by the first driver element;

a delivery system to maintain the pharmaceutical product in a position to receive the acoustic energy from the acoustic lens and cause ejection of a droplet of pharmaceutical product, the delivery system including a pressurization system that controls pressure of the pharmaceutical product;

an energy source to provide energy to the first driver element; and
a second driver element coupled to the energy source to provide drive signal to ejectors
that droplets of the pharmaceutical product, wherein the second driver element includes a
multiplexing circuit that directs RF energy from the energy source to switch one or more groups
of the ejectors on and off.

12. (previously presented) The apparatus of claim 11 further comprising:
an ejector head to cover the acoustic lens, the ejector head being sterilized by an ultraviolet radiation source.

13. (previously presented) The apparatus of claim 1 further comprising:
a MEMS cover to that protects the driver element from contamination when the driver element is not outputting acoustic energy.

14. (currently amended) An apparatus to output pharmaceutical product for inhalation into the respiratory system of a patient, the apparatus comprising:
a portable energy supply;
at least one transducer coupled to the portable energy supply, the at least one transducer to output acoustic energy below 15 Mhz and directed to a capillary wave;
a plurality of lenses positioned between the at least one transducer and the capillary wave to receive and focus energy from the at least one transducer; and
a delivery system to maintain a reservoir of pharmaceutical product, a distance from a top surface of a lens and a surface of the reservoir of pharmaceutical product being less than 150 micro meters, the reservoir of pharmaceutical product to receive energy from the plurality of lenses, the received energy to cause ejection of a plurality of droplets; and
a drive circuit coupled to the portable energy source to provide drive signal to ejectors
that eject droplets of the pharmaceutical product, wherein the second driver element includes a

multiplexing circuit that directs RF energy from the portable energy source to alternately switch groups of the ejectors on and off.

15. (original) The apparatus of claim 14 wherein each lens in the plurality of lenses is a Fresnel lens.

16. (previously presented) The apparatus of claim 14 wherein each lens in the plurality of lenses is a plastic lens.

17. (original) The apparatus of claim 14 further comprising:
a circuit that detects a flow of air going into a patient's lungs and couples the transducer to the portable energy supply when a critical air speed is reached.

18. (canceled)

19. (previously presented) The apparatus of claim 1 wherein the delivery system includes a section for insertion into a human orifice, the section for insertion into the human orifice to increase an amount of the pharmaceutical product delivered to a patient.

20. (canceled)

21. (previously presented) The apparatus of claim 1 wherein the capillary wave is generated by relaxation of a principle mound.

22. (previously presented) The apparatus of claim 14 wherein a diameter of at least one droplet in the plurality of droplets is less than 5 micrometers.

23. (currently amended) A method of delivering pharmaceutical product comprising:
generating a pulse of acoustic energy, the pulse having a short duration and low frequency such that the pulse of acoustic energy generates capillary waves, at least one capillary wave ejecting at least one droplet of pharmaceutical product;
generating a drive signal to ejectors that eject droplets of the pharmaceutical product,
wherein generating the drive signal includes multiplexing RF energy from an energy source to
alternately switch groups of the ejectors on and off;

focusing the acoustic energy between the pulse of acoustic energy and the capillary waves; and,

positioning the droplet near a human orifice for inhalation into a respiratory system.

24. (previously presented) The method of claim 23 wherein the at least one capillary wave is formed by the relaxation of at least one principal mound of pharmaceutical product.

25. (previously presented) The method of claim 24 wherein the at least one principal mound is generated by focusing the pulse of acoustic energy.

26. (currently amended) An apparatus comprising:

a pharmaceutical product;

a first driver element to generate acoustic energy, the first driver element generating acoustic energy in pulses that are of a short duration and low frequency such that a droplet of the pharmaceutical product is output from a capillary wave;

an acoustic lens positioned between the driver element and the capillary wave to focus the acoustic energy generated by the first driver element; and

a delivery system to maintain the pharmaceutical product in a position to receive the acoustic energy from the acoustic lens and cause ejection of the droplet of the pharmaceutical product; and

a second driver element coupled to a portable energy source to provide drive signal to ejectors that eject droplets of the pharmaceutical product, wherein the second driver element includes a multiplexing circuit that directs RF energy from the portable energy source to alternately switch groups of the ejectors on and off.